NICE³
Success Story

Energy-Efficient Food-Blanching System

New Blanching System Increases Productivity while Saving Energy

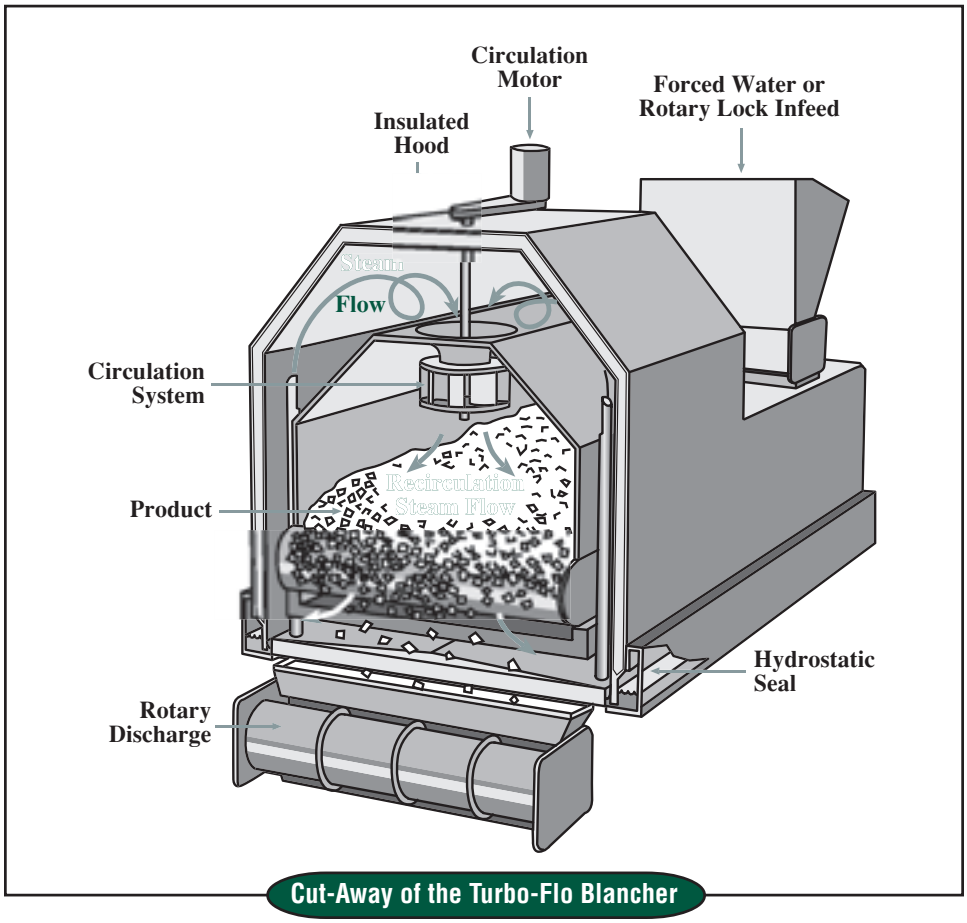
Benefits

- Improved product flavor and texture as a result of reduced overcooking
- Minimization of wastewater
- Energy savings as a result of reduced processing time

Applications

The Turbo-Flo System can be used in any food-blanching operation.

Key Technology, Inc., is an equipment supplier to the food industry. Its product line includes complete systems for automated inspection, specialized conveying, and food processing and preparation. Known for innovations in food processing, Key Technology teamed with the U.S. Department of Energy (DOE) in response to a joint study by DOE and the National Food Processors Association that called for "energy conservation in the food-processing industry." Key Technology received a $153,000 grant from DOE's NICE³ (National Industrial Competitiveness through Energy, Environment, and Economics) Program to demonstrate the energy-saving and waste-reducing Turbo-Flo® Blancher/Cooker System, a revolutionary advance in blanching and cooking technology.



Cut-Away of the Turbo-Flo Blancher

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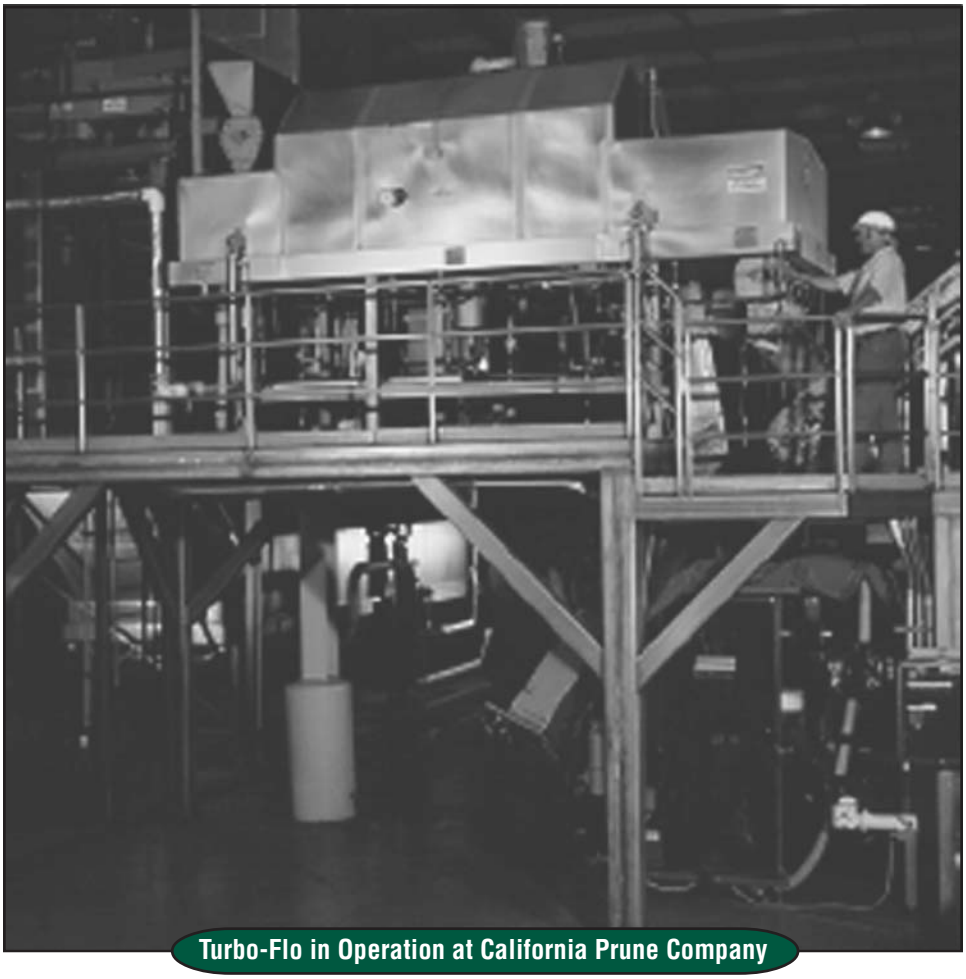
The project started in 1996 with goals to build a small-capacity Turbo-Flo Blancher/Cooker and develop test criteria in cooperation with the Washington State University Food Science Department to accelerate the company's commercialization of the system.



Turbo-Flo in Operation at California Prune Company

"The Turbo-Flo evenly distributes steam to the product, creating a very consistent quality product…"

–Bill Eash
Maintenance Manager
at Cal Prune

OFFICE OF INDUSTRIAL TECHNOLOGIES

ENERGY EFFICIENCY AND
RENEWABLE ENERGY
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Project Partners

- Key Technology, Inc.
  Walla Walla, WA
- Washington State University
  Cooperative Extension
  Energy Program
  Olympia, WA

Technology Benefits

Traditional blanchers use a tremendous amount of steam that is energy intensive, often overcooking the product being blanched. Turbo-Flo reduces the amount of steam, saving energy and improving product quality. While current Turbo-Flo applications include potatoes, other vegetable products and fruit, the technology is appropriate for meat, seafood, poultry, and most canned/frozen fruit and vegetable products.

Demonstration Results

The Turbo-Flo Blancher/Cooker offers shorter processing times using patented convection heating dynamics that offer higher heat transfer efficiency. Reduced processing time and more efficient cooking result in energy savings. The uniquely efficient cooking method uses less steam and produces less water condensate, minimizing wastewater. An additional benefit is improved product flavor and texture.

Key Technology searched for processing partners currently using traditional blanching or cooking technologies who would participate in a testing program. Randy Unterseher, Product Marketing Manager and Key Technology's administrator of the NICE^3 grant, reports several testing successes to date. "Testing has been completed at one major U.S. vegetable processor's plants on six different vegetable products and at a potato-processing facility," Unterseher said. To give an example of the success of this technology, cauliflower blanched with a Turbo-Flo unit resulted in an average steam-to-product ratio of 1/9.6. The steam-to-product ratio is the measurement gauge used by plant personnel to evaluate equipment efficiency. The ratio indicates the pounds of steam used to produce one pound of blanched product. The initial product tests were run in October 1997. Data collected on existing in-plant blanchers produced an average ratio of 1/4.16. Although these data are representative of only one product, results from other products have been similar.

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Data evaluated by DOE indicate a single Turbo-Flo system reduces energy consumption by up to 71% and waste water generation by as much as 80%, based on a typical food processor blanching 15 tons of product an hour for 1560 h/yr. Given these projections, a single Turbo-Flo system offers an average annual savings of $85,000 with a 1.65-year payback. The data and testing results to date also demonstrated that the system meets the goals of the Pollution Prevention Act of 1990 and "cleaner production per unit" principles.

Commercialization Success

Customers have also been happy with the improved quality of the products being blanched. Bill Eash, Maintenance Manager at Cal Prune said, "The Turbo-Flo evenly distributes steam to the product, creating a very consistent quality product...We were so satisfied with the first Turbo-Flo we decided to buy two more as part of our current plant expansion." From the beginning of Key Technology's NICE^3 project through 2001, 40 units that use the innovative blanching technology have been sold in the United States.

Key Technology is the first company to implement a NICE^3 project in the state of Washington. "This is yet another example of Key's ability to apply R&D innovation to solutions for the emerging needs of our customers," said Richard Hebel, Vice President of Marketing for Key Technology.

NICE^3 – National Industrial Competitiveness through Energy, Environment, and Economics:
An innovative, cost-sharing program to promote energy efficiency, clean production, and economic competitiveness in industry.
This grant program provides funding to state and industry partnerships for projects that demonstrate advances in energy efficiency and clean production technologies. Awardees receive a one-time grant of up to $525,000. Grants fund up to 50% of total project cost for up to 3 years.

For project information, contact:

Randy Unterseher
Key Technology, Inc.
150 Avery Street
Walla Walla, WA 99362
Phone: (509) 529-2161
Fax: (509) 394-3270

Home Page:
www.keyww.com

For more information about the NICE^3 Program, contact:

Lisa Barnett
Program Manager
NICE^3 Program
U.S. Department of Energy
1000 Independence Avenue SW
Washington, D.C. 20585-0121
Phone: (202) 586-2212
Fax: (202) 586-7114
lisa.barnett@ee.doe.gov

Visit our home page at
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